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Results of Statistical Analysis of Hiring Data Provided by Pearl Harbor Naval Shipyard:

Supplementary Report, 2008

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Prepared by:

SMS **Research & Marketing Services, Inc.**
May, 2008

EXHIBIT A

INTRODUCTION

I am James E. Dannemiller, Executive Vice President of SMS Research & Marketing Services, Inc., and President of SMS Research, a division of that company. I am an experienced researcher and statistician with experience in preparing research for litigation. My *curriculum vitae* is attached to this report. It describes other cases in which I have provided testimony.

I have been asked by Clayton Ikei, Esq., to review certain statistical data related to employment and hiring decisions made at the Pearl Harbor Naval Shipyard between 1999 and 2002, and to render an opinion on whether those data present any evidence of bias. The investigation is being carried out with reference to the complaint brought by Mr. Ronald L. Obrey, Jr. in The United States District Court for the District of Hawaii, Civil No. 02-00033 HG-LEK. Mr. Obrey has alleged that Pearl Harbor Naval Shipyard has made hiring decisions that are biased in favor of white applicants. My investigation of data provided by officials at Pearl Harbor Naval Shipyard will focus on whether or not those data provide such evidence.

This report is a supplementary update to my initial, 2002 analysis. It takes into account some critical comment produced by defendant in subsequent court proceedings.

I have been retained on this project at a cost of $200 per hour. Costs for other researchers are $65 per hour and $35 per hour for clerical work. To date the cost of the project is in the neighborhood of $10,000.

DATA

I received the initial data from the Law Offices of Clayton Ikei between July and November 2002. They include:

1. Candidates for Selected Positions at Pearl Harbor[1]: Being a description of all applicants for eleven positions included in Defendant's First Response to Interrogatories, July 24, 2002. The respondent provided data on 11 positions as requested. The response included some missing information.

2. Senior Management Positions Filled at Pearl Harbor Naval Shipyard since 1998 and not mentioned above[2]; A Response to Plaintiff's Interrogatory 25: Being a description of characteristics of about 1,000 applications for approximately 160 selection decisions made at Pearl Harbor Naval Shipyard between 1999 and 2002.

3. Resumes of all successful candidates for the 11 senior management positions referenced in Item 1. Defendant's Response to Request for Production of Documents.

4. A subset of the data in 1 and 2 above, produced by defendants' expert in 2005[3].

The major focus of my investigation has been on Items 1 and 2 above. Together they were provided by defendant in response to interrogatories asking for descriptions of the entire set of cases relevant to this case. Although the language of interrogatories and responses does not provide absolute certainty about the exact start and end dates of the periods, nor of the exact definitions of cases included in the data, it seems reasonable to assume that the combination of information from items 1 and 2 above can be taken as a representative if not an exhaustive list of cases. They represent the time period and the GS levels of interest to the Plaintiff.

Upon receiving the data described above, I first entered them into machine-readable format to facilitate analysis. Using the general format of item 2, I added data from item 1, producing a single combined dataset. During the course of analysis, I created some additional variables based on the original data received for Pearl Harbor Naval Shipyard. I did not change the values or the original or otherwise alter them in any way.

For purposes of this report, I have used a dataset provided by defendant's expert for my second analysis component. Those data represent a set of records that describe results of the subset of fully competitive competitions. While defendant's expert and I used slightly different rules to cull this subset, our principles are the same. It seems useful to avoid disagreements that are trivial with respect to the discussion at hand.

My raw data files will be presented in hardcopy upon request.

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1 Ref.: "Candidates for Selected Positions at Pearl Harbor; Defendant's First Response to Interrogatories, July 24, 2002".

2 Ref.: "Senior Management Positions Filled at Pearl Harbor Naval Shipyard Since 1998; A Response to Plaintiff's Interrogatory 25".

3 Ronald L. Obrey, Jr. v. Hansford T. Johnson in his capacity As Acting Secretary of the Navy, Civil No. 02-00033 HG-LEK, Report of Gary R. Skoog, Ph.D., May 17, 2005.

ANALYSIS

Rationale

I begin with the assumption that an unbiased system of any kind produces unbiased results. That is, over a reasonably large number of cases an unbiased process will produce outputs that are independent of the characteristics of the inputs. If outputs are dependent on one or more characteristics of the input cases, then there is evidence that the generating system is biased. Specifically for this case, a set of employment selections that are made without any dependence on the race or national origin of the applicants will produce final selections that are independent of the race and national origin of the applicants.

The data provided by Pearl Harbor Naval Shipyard describe a set of cases in which both the race of the applicants and the race of the persons selected are known. If the system within which those decisions were made is not biased, then we can reasonably expect to find that the results of those decisions are statistically independent of the race and national origin of the original applicants.

Hypotheses

Consistent with the nature of the complaint and the nature of the data supplied by Pearl Harbor Naval Shipyard, we are interested in three[4] aspects of the data.

1. Non-Competitive Selections: Selection for some positions involved only one applicant. It will not be possible to test whether or not those selections were made without bias toward one particular race because only one race was represented. It will be useful, however, to determine whether non-competitive selections favored one race over another. Our hypothesis will be that non-competitive selections were applied independent of the race of the person selected.

2. Competitive Selections with Complete Data: For the majority of cases described by the Shipyard, applicant selections were made on a competitive basis. Most of those involved at least one white and one non-white applicant, and most contained sufficient information on the applicants to conduct an analysis. These cases are of central concern to this investigation because they are most similar to plaintiff's allegation. All of the cases involved in this analysis have: (a) no missing data with respect to race; (b) at least two applicants; (c) at least one white applicant; (d) at least one non-white applicant; and (e) a selection was made. Our hypothesis will be that, for these cases, selection was independent of the applicant's race.

3. All Cases: Results for all competitive and non-competitive cases made between 1990 and 2002. By including all cases, competitive and non-competitive, it is possible to assess the overall impact of the Pearl Harbor Naval Shipyard GS13 through GS15 selection system between 1999 and 2002. We hypothesize that the entire selection system, being unbiased, will produce results (selections) that are independent of the race of the applicant. Cases included in the test need only have selection and race data.

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[4] The original report contained a fourth item, an analysis of competitive selections of all types. The analysis was accurate and wholly consistent with other results reported here. It did not add significantly to the argument, however, and was left out of this report.

Analysis

The analysis question is whether the results of a reasonable large number of cases taken from an unbiased selection system display unbiased selections. Specifically, we ask, did the race or national origin of persons selected by this system compare reasonably with the race or national origin of the applicants?

The data involved represent the entire population of selections carried out in defendant's system between 1999 and 2002. As such, the tabular results of the analysis are real and significant. Statistical tests are neither required nor meaningful under any particular probability model. Applied statisticians nevertheless continue to apply statistical tests as a kind of "rule of thumb" for assessing results from population data.

The use of statistical tests in this situation is usually applied to address the question, "How large a difference is large?" Suppose, for example, we expect that an unbiased system will produce 25 percent white and 75 percent non-white selections, and we find that it actually produced 29 percent with and 71 percent non-white selections. The results are a fact. The system produced more white selections than expected. The population data provide no evidence that the empirical selection results came from an unbiased system.

But, some observers might feel a one percentage point spread is too rigorous a criterion for branding the system as "biased". We need a criterion for determining how large a difference between expected and observed values will be needed to reject the null hypothesis of no bias.

One method might be to choose an arbitrary *a priori* value for the percentage differences that will be used as the criterion for rejection. It is unlikely that plaintiff and defendant's experts would agree on that number easily. An alternative method of setting the criterion is to apply a statistical test – even though it is uncalled for. The process is equivalent to stating: "If these data were actually a random sample of system outputs, and a statistical test were to show that results were powerful enough to reject the hypothesis that the results could be generalized to the population from which that sample was drawn, then it seems reasonable to reject the null hypothesis using the population data."

Thus our analysis method is simply to summarize the results of the Naval Shipyard selection process for GS 13 through GS 15 positions between 1999 and 2002, evaluate the raw results of each table, and use a statistical test to estimate the size of the difference between expected and observed results.

Statistical Tests

An appropriate model for testing the difference between the expected outcomes of the hiring system and its actual empirical outcome is provided by the chi-square test of independence. The chi-square test, introduced by Karl Pearson in 1900, is a very general test appropriate for testing relationships between two nominal variables. It is frequently used by statisticians to test whether two variables are related based on differences between expected outcomes and those empirically observed. Because all of the tables we will examine are two-by-two contingency tables, it is appropriate to use Yates' contingency correction as the specific chi-square statistic.

There are many assumptions underlying the use of the chi-square test. They result from the fact that the test was developed for use with random samples. Although statistical texts differ in their presentation of these assumptions, the list below can be considered representative.

1. **Random Sample Data**: The data are expected to come from a simple random sample (or an equal probability of selection sample) drawn from the population under study.

2. **Reasonably Large Sample Size:** Experts differ as to the definitions of "large". Most agree that samples of 50 or more are suited to the test. Some will go as low as 15 or 20. Regardless, there is no set rule.

3. **Reasonably Large Cell Sizes:** Again experts differ. Most agree that, for two-by-two contingency tables, all cells must contain at least five cases, and some expect at least ten. Most agree that reliable results cannot be obtained if any cell size is zero.

4. **Finite Observations**. All observed values must be classifiable in categories.

5. **Independent Observations:** An observation can appear in one and only one cell.

6. **Measurement Level**. Chi-square tests can be applied to data measured at the nominal, ordinal, or interval level.

7. **Known Distribution**. A hypothesized distribution (binomial, Poisson, normal, etc.) should be specified before the test is applied. That is necessary in order to calculate the expected values in each cell without using the observed values. Usually, the binomial distribution is used, and expected values are taken as the crossproduct of row and column totals divided by sample size.

8. **Similar Distribution**. All observed values are expected to have the same underlying distribution.

9. **Preset Alpha Levels:** The alpha level, or level of significance for the test results, must be specified before the test is run. There are many considerations that might affect the choice of alpha. In the absence of other considerations, statisticians often use $\alpha = .05$.

10. **Non-Causal Hypotheses:** The chi-square test is not suitable to hypotheses of the form X causes Y or Y causes X. Results attest only to the hypothesis that X is related to Y.

11. **Normally Distributed Deviations:** Deviations (differences between observed and expected values) are expected to have a roughly normal distribution.

When used for non-random sample or population data, some of these assumptions are often relaxed. Certainly when used with population data, assumption number one must be relaxed. Other assumptions may be overlooked as well. The results might be to say: "If these data were from a random sample, and the underlying probability function were binomial system, and my sample size were a bit larger, then the chi-square test would set the criterion for rejecting the null at X. I will use X as my criterion for rejecting the null in these data." The important results of this study are found in the tabulated data themselves. In fact, we believe they stand on their own. Statistical tests have been included to establish fixed criteria for deciding "how large is large".

For each of the hypotheses described earlier the chi-square test was applied as follows. First, a hypothesis was established as H_O: There is no statistically significant relationship between the selection of an applicant and his or her race or national origin. Data were arranged in two-by-two contingency tables in which selection was measured as either "selected" or "not selected", and race was measured as white or non-white. An alpha, or level of significance, of .05 was used for all tests.

Rather than calculate the statistics by hand, I used the Statistical Package for the Social Sciences (SPSS), a powerful and popular package of statistical routines used by statisticians and social researchers around the world. Using a statistical package reduces the possibility of errors in calculations and allows calculations of precise probabilities.

The chi-square test returns a chi-square value corrected for continuity and a test of significance. The value of chi-square has no substantive meaning in and of itself. Higher values indicate greater dependence between the two variables being tested. The significance test is expressed as the probability that the resulting chi-square value could have been higher than the one found in the data. This is sometimes referred to as the probability that results as severe as those found could have been obtained by chance, or that the difference between the expected and actual values could have occurred by chance.

RESULTS

1. Non-Competitive Selections

If the Pearl Harbor Naval Shipyard non-competitive selections were not biased in any way, then we would expect that non-competitive selections would have been applied proportionately to white and non-white personnel. Table 1 shows the results for competitive and non-competitive selections between 1999 and 2002 involving 767 white and non-white personnel. .

Table 1: Chi-Square Test of Independence: Hypothesis One

		Selection Type		Total
		Non-Competitive	Competitive	
White	Count	21	130	151
	expected value	11.2	139.8	151.0
	column percent	36.8%	18.3%	19.7%
Non-white	Count	36	580	616
	expected value	45.8	570.2	616.0
	column percent	63.2%	81.7%	80.3%
Total	Count	57	710	767
	expected value	57.0	710.0	767.0
	column percent	100.0%	100.0%	100.0%

Chi-square, Yates continuity correction = 11.461; df = 1; significance = .001.

Among the non-competitive selections, 37 percent were white and 63 percent were non-white. The competitive selections covered 18 percent whites and 82 percent non-whites. Non-competitive situations were applied nearly twice as often to white than were competitive selections. About 14 percent white applicants received non-competitive appointments compared with six percent of non-whites.

The chi-square value was 11.461, which was significant at the .001 level. Using that criterion we reject the null hypothesis that the choice to use a non-competitive selection procedure was independent of the race of the applicant. The observed level of difference would occur by chance only once in 1,000 trials. Rejecting the null means we can accept the alternative hypothesis that the use of non-competitive selection procedures was not independent of the race of the applicants in the cases under study. There is no evidence in these data that the Pearl Harbor Naval Shipyard selection process was unbiased by race.

2. Competitive Cases with Complete Data

If competitive selections were not biased by race, then we would expect that persons selected for positions at Pearl Harbor Naval Shipyard would have been distributed proportionately to the numbers of white and non-white applicants. Table 2 shows the results of 634 competitive selections. Those selections and applicants represent a rigorously defined subset of the total cases reported by Pearl Harbor Naval Shipyard between 1999 and 2002. They include only fully competitive selections involving at least one white and one non-white applicant, for which a selection was ultimately made, and for which the race of all applicants was known.

Table 2: Chi-Square Test of Independence: Hypothesis Two

		Applicant Selected		
		No	Yes	Total
White	count	128	27	155
	expected value	139.6	15.4	155.0
	column percent	22.4%	42.9%	24.4%
Non-white	count	443	36	479
	expected value	431.4	47.6	479.0
	column percent	77.6%	55.6%	75.4%
Total	count	571	63	634
	expected value	571.0	63.0	634.0
	column percent	100.0%	100.0%	100.0%

Chi-square, Yates continuity correction = 13.677; df = 1; significance = .000.

Based on the characteristics of the applicants, we might have expected that 25 percent of the selections would have been white and 75 percent would have been non-white. Table 2 shows that, in the fully competitive selections made between 1999 and 2002, 43 percent were white and 56 percent were non-white. More whites were selected than expected. In fact, the success rate for whites was 18 percent and the success rate for non-whites was eight percent.

The chi-square value was 13.677, significant at the .000 level. The probability that the chi-square value could have been obtained by chance was less than one in one thousand. That means we must reject the null hypothesis that the selection process was independent of the applicant's race. We cannot rule out the alternative hypothesis that competitive selections were dependent on the race of the applicants. There is no evidence in these data that the Pearl Harbor Naval Shipyard selection process was unbiased by race.

3. All Cases

We have seen that Pearl Harbor Naval Shipyard data describe several different selection situations, two of which have been independently tested above. It is possible to combine all of those data into a single dataset that describes nearly all[5] of the selections made during the target period. Table 3 shows the results of that analysis. It includes all cases and applicants for whom full data are available. It includes competitive and non-competitive cases, regardless of the types of applicants involved. The data represent the best approximation of the overall effect of the Pearl Harbor Naval Shipyard system on the applicants involved. If these selections were unbiased, we can expect that, overall, the persons selected for positions at the shipyard would be distributed proportionately by race.

Table 3: Chi-Square Test of Independence: Hypothesis Three

		Applicant Selected		
		No	Yes	Total
White	Count	215	59	274
	expected value	232.4	41.6	274.0
	column percent	24.0%	36.9%	26.0%
Non-white	Count	679	101	780
	expected value	661.6	118.4	780.0
	column percent	75.0%	63.1%	74.0%
Total	Count	894	160	1,054
	expected value	894.0	160.0	1,054.0
	column percent	100.0%	100.0%	100.0%

Chi-square, Yates continuity correction = 11.604; df = 1; significance = .001.

If all of the selections of different types were wholly unrelated to the race or national origin of the applicants, then we would expect to find that 26 percent of those selected would be white and 74 percent would be non-white. Instead, the records show that 37 percent were white and 63 percent were non-white. Between 1999 and 2002, 22 percent of white applicants were selected and 13 percent of non-white applicants were selected.

The chi-square value was 11.604, significant at the .001 level. We are departing significantly from the assumptions of the statistical test at this point. In particular, the probability distribution underlying different kinds of sections (e.g., fully competitive vs. non-competitive) are not the same. But for the sake of selecting an unbiased criterion for assessing the null hypothesis, the significance of the chi-square test will be used.

Chances are one in a thousand that these results could have come from an unbiased system. For the overall effect of all selections reported by Pearl Harbor Naval Shipyard we must reject the null hypothesis that selection was independent of race and accept the alternative hypothesis that selections were not independent of race in the cases under study. There is no evidence in these data that the shipyard's selection process was unbiased by race.

[5] There were eight cases in which no selection was made, and 33 applicants had no race indicator. These cases cannot be included in the test to be conducted here.

Individual Selections Analysis

While the aggregate analysis fails to demonstrate any evidence that the selection process was not biased, defendant's expert suggests the possibility that other forces may be at work[6]. Specifically, the individual selection events might show no evidence of bias while the pooled results exhibit bias. This counterintuitive result is classically referred to as Simpson's Paradox[7].

Concerned that Simpson's Paradox might be at work, defendants' expert examined 58 individual selections and found, using chi-square tests, that none reached a serious level of bias at the .05 level (See Exhibit 1 in Appendix). Simpson's Paradox could not be ruled out.

Defendant's data exemplify the statistical issues that prompted my initial focus on aggregate data. The substantive issue is not whether any one case exhibited bias, but whether the set of all selections for GS13 through GS15 Shipyard positions exhibited bias. Furthermore, statistical tests for the individual level data are problematic[8]. But, because there is a possibility that the aggregate results might be spurious, it becomes necessary to investigate the data at the individual case level.

I began with the data in Exhibit 2 (See Appendix) describing the outcomes of 58 individual hiring selections. I added the probabilities that a white or non-white applicant would be selected. If there were five applicants for a position, and two where white and three non-white, the probability that a white would be selected was .40 and the probability that a non-white person would be selected was .60. If a single applicant was to be selected, we would expect, all other things being equal, that a non-white applicant would be selected under these conditions.

The 58 cases involved selection of 63 applicants from 634. Had the probabilities alone been used to make the selection, there would have been eight white and 55 non-whites selected.

Next I classified the outcome of each of the 58 selections as either "expected" or "not expected" based on whether the person selected was from the expected group, or from the group that was not expected.

In the 58 cases that make up this dataset, 41 (or 70%) resulted in the selection of a person of the status expected according to probabilities. 17 cases (29%) resulted in the selection of an applicant from the group that was not expected. Tabulation of those cases by the status of the applicant is shown in Table 4.

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6 Ronald L. Obrey, Jr. v. Hansford T. Johnson in his capacity As Acting Secretary of the Navy, Civil No. 02-00033 HG-LEK, Report of Gary R. Skoog, Ph.D., May 17, 2005.

7 Simpson's Paradox is one example of a class of similar paradoxes known collectively as the reversal paradox. Together they extend beyond a reversal of results from individual and pooled analyses to cover changes in magnitude of findings.

8 The chi-square test is not appropriate for the task. Most individual selection data have sample sizes less than 30. In fact most are less than 15. Nearly all of them have very small or even zero cell sizes. This renders chi-square tests ineffective for the task at hand.

Table 4: Results of 58 Selection Events

Race or National Origin of Person(s) Selected	Outcome of the process was.....					
	Expected		Not Expected		Total	
	Num	Pct	Num	Pct	Num	Pct
White	8	19.5	17	100.0	25	43.1
Non-White	33	80.5	0	0.0	33	56.9
Total	41	100.0	17	100.0	58	100.0

Of the 58 individual selection events, 41 produced results that would have been expected according to probabilities. In those 41 cases, the position was awarded to an applicant from the group with the highest probability of selection. This group also included three cases in which the probabilities for both groups were .50 exactly. In 33 of the 41 selection events a non-white was selected and in 8 cases a white was selected.

There were a total of 17 events in which an unexpected result occurred. That is, the raw probabilities suggested that a person of one race would be selected and a person of the other race was awarded the job. In all 17 of those cases, a white applicant was selected.

The Simpson's Paradox argument is rooted in a comparison of statistical tests based on pooled and unpooled data. The tests present problems at both levels. But if we look at the empirical results of the Shipyard data, findings at both the individual and aggregate levels are consistent. At the aggregate level, the results of selections are not what we would expect of an unbiased system. At the level of individual selections, many events produced outcomes that were consistent with *a priori* probabilities and many did not. All of those that did not, resulted in the selection of a white applicant.

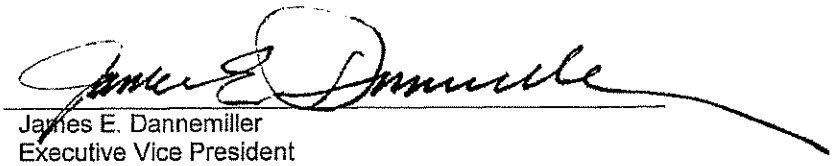
Regardless of whether we look at pooled or unpooled data, I do not find evidence in the Navy's records that the selection process was not biased in favor of white applicants.

CONCLUSIONS

As a result of my analysis of data provided to the plaintiff by Pearl Harbor Naval Shipyard officials, I have reached the following conclusions. There is no statistical evidence in these data that the selection process for GS13 through GS15 positions between 1999 and 2002 were unbiased with respect to race. Whether taken individually by type of selection process or collectively as an indication of the overall impact of the selection system, statistical tests required rejection of the null hypothesis that selection was independent of the race of the applicants for those positions. In all tests, the odds were one in one thousand that the empirical results could have resulted from an unbiased selection process.

While these results do not speak directly to the details of plaintiff's particular application, they do show that Mr. Obrey's application was processed in a system that was characterized by a bias in favor of white applicants. In each of the analyses described here, white applicants were nearly twice as likely to be selected as were non-white applicants.

Respectively submitted,



James E. Dannemiller
Executive Vice President

May 5, 2008
Date

APPENDIX

Appendix A: Exhibit 1
Data for 58 Fully Competitive Cases

Case No.	Num People Applied	Num. Persons Selected	Race or national origin of applicants				X2 Yates corr.	Probabilities*		Race of persons Selected		Result	
			non-white		white			white	non-white	white	nonwhite	was expected	favored white
			selected	rejected	selected	rejected							
7	12	1	1	8	0	3	0.364	0.25	0.75	0	1	1	
8	9	1	1	7	0	1	1.723	0.11	0.89	0	1	1	
9	3	1	0	1	1	1	0.188	0.67	0.33	1	0	1	
10	4	1	1	2	0	1	0.444	0.25	0.75	0	1	1	
13	4	1	1	2	0	1	0.444	0.25	0.75	0	1	1	
14	14	1	0	10	1	3	0.242	0.29	0.71	1	0	0	1
15	13	1	1	10	0	2	0.997	0.15	0.85	0	1	1	
16	14	1	1	11	0	2	1.122	0.14	0.86	0	1	1	
17	11	1	1	9	0	1	2.228	0.09	0.91	0	1	1	
22	9	1	1	7	0	1	1.723	0.11	0.89	0	1	1	
25	16	1	0	14	1	1	1.371	0.13	0.88	1	0	0	1
26	16	1	0	15	1	0	3.484	0.06	0.94	1	0	0	1
27	20	1	1	16	0	3	1.011	0.15	0.85	0	1	1	
28	11	1	0	10	1	0	2.228	0.09	0.91	1	0	0	1
29	16	1	0	14	1	1	1.371	0.13	0.88	1	0	0	1
30	7	1	0	5	1	1	0.263	0.29	0.71	1	0	0	1
34	7	1	1	5	0	1	1.215	0.14	0.86	0	1	1	
39	13	1	1	11	0	1	2.731	0.08	0.92	0	1	1	
41	7	1	1	5	0	1	1.215	0.14	0.86	0	1	1	
44	4	1	0	3	1	0	0.444	0.25	0.75	1	0	0	1
54	2	1	1	0	0	1	0.000	0.50	0.50	0	1	1	
64	25	1	1	19	0	5	0.586	0.20	0.80	0	1	1	
65	24	1	1	18	0	5	0.533	0.21	0.79	0	1	1	
66	24	2	2	17	0	5	0.023	0.38	0.62	0	2	2	
70	4	1	1	2	0	1	0.444	0.25	0.75	0	1	1	
71	21	1	1	14	0	6	0.236	0.29	0.71	0	1	1	
74	27	1	0	22	1	4	0.682	0.19	0.81	1	0	0	1
75	11	1	0	9	1	1	0.749	0.18	0.82	1	0	0	1
76	5	1	0	3	1	1	0.052	0.40	0.60	1	0	0	1
79	4	1	1	2	0	1	0.444	0.25	0.75	0	1	1	
82	9	1	1	7	0	1	1.723	0.11	0.89	0	1	1	
84	8	1	1	6	0	1	1.469	0.13	0.88	0	1	1	
86	4	1	0	1	1	2	0.444	0.75	0.25	1	0	1	
89	5	1	1	2	0	2	0.052	0.40	0.60	0	1	1	
90	17	1	0	6	1	10	0.101	0.65	0.35	1	0	1	
92	2	1	0	1	1	0	0.000	0.50	0.50	1	0	1	
105	7	1	1	4	0	2	0.263	0.29	0.71	0	1	1	
107	9	1	0	7	1	1	0.502	0.22	0.78	1	0	0	1
109	13	2	1	8	1	3	0.037	0.08	0.92	1	1	1	
110	13	1	0	8	1	4	0.061	0.38	0.62	1	0	0	1
111	21	4	1	12	3	5	1.248	0.13	0.87	3	1	0	3
113	15	1	1	13	0	1	3.233	0.07	0.93	0	1	1	
115	8	1	0	5	1	2	0.076	0.38	0.63	1	0	0	1
121	3	1	1	1	0	1	0.188	0.33	0.67	0	1	1	
128	9	1	1	7	0	1	1.723	0.11	0.89	0	1	1	
129	4	1	1	2	0	1	0.444	0.25	0.75	0	1	1	
134	5	1	1	3	0	1	0.703	0.20	0.80	0	1	1	
149	7	1	1	4	0	2	0.263	0.29	0.71	0	1	1	
151	3	1	1	1	0	1	0.188	0.33	0.67	0	1	1	
152	4	1	0	2	1	1	0.000	0.50	0.50	1	0	1	
153	30	1	0	23	1	6	0.411	0.23	0.77	1	0	0	1
154	16	1	0	12	1	3	0.356	0.25	0.75	1	0	0	1
159	15	1	1	12	0	2	1.247	0.13	0.87	0	1	1	
1001	10	1	0	3	1	6	0.411	0.70	0.30	1	0	1	
1006	23	1	0	11	1	11	0.002	0.52	0.48	1	0	1	
1009	5	1	0	3	1	1	0.052	0.40	0.60	1	0	0	1
1010	7	1	1	5	0	1	1.215	0.14	0.86	0	1	1	
1011	5	1	1	3	0	1	0.703	0.20	0.80	0	1	1	
Pers.	634	63	36	443	27	128				27	36	42	19
Cases		58								25	35	41	17

* Probability for white is one minus the probablity listed for non-whites. Probability for case 66 is probabilty of getting two non-white, case 109 is probability of getting at least one non-white, and case 111 is the probability of getting at least two non-whites.

Appendix B: Curriculum Vitae of James E. Dannemiller

JAMES E. DANNEMILLER
President, SMS Research

Mr. Dannemiller is a veteran with 30 years of professional research experience. His technical expertise covers research design, questionnaire design, sampling, data collection, all areas of project design, plus univariate, bivariate, and multivariate statistical techniques. Mr. Dannemiller has been principal investigator for many types of research. His expertise ranges from marketing and consumer research, through media measurement and advertising impact, to market segmentation and customer satisfaction. His public opinion research experience ranges from political polling, through issues research, to program evaluation.

He is responsible for many important research projects conducted in Hawaii over the past three decades. He has directed seminal research in visitor marketing, health status monitoring, visitor expenditure measurement, homelessness assessment, housing needs, sovereignty for Native Hawaiians, and charitable contribution research. He has conducted research in a broad and diverse range of fields including health, education, human services, transportation, media, banking, retailing, consumer behavior, customer satisfaction, and many others.

Prior to joining SMS Research in 1978, Mr. Dannemiller spent nine years as the Director of the Survey Research Office at the University of Hawaii at Manoa. In that capacity, he directed all of the survey and institutional research for the University's nine campuses, and provided consultation to faculty and staff on research design and analysis.

Mr. Dannemiller is an accomplished speaker and frequent lecturer at the University of Hawaii. He is a member of the adjunct faculty at Hawaii Pacific University and teaches at Chaminade University. He teaches marketing research, consumer behavior, and business statistics. He is a member of the Travel and Tourism Research Association, the American Marketing Association, and the American Statistical Association. He serves on the Board of Directors for Catholic Charities Hawaii.

Since 1974, Mr. Dannemiller has been involved with survey research and statistical analysis in support of litigation. He has been qualified as an expert in these and related fields in both State of Hawaii and Federal Court and the District Court of San Francisco. He has prepared testimony and provided expert witness services for plaintiffs and defendants and has worked on cases for government agencies, businesses, and individuals. In recent years, Mr. Dannemiller has developed a minor specialty in the application of sampling and inferential statistics to class action litigation. Of particular importance in this arena are his services to the Marcos case and the Pleasant Hill Cremation case. The attached list describes some of Mr. Dannemiller's court-related research.

Education:

BA, History, Miami University, Oxford, Ohio
BA, East Asian History, University of Hawaii, Manoa
MA, Sociology, University of Hawaii, Manoa

Professional References:

George Willoughby, Director of Research Development, Hawaiian Electric Company, Inc., 543-4741
Alvin Onaka, Dept. of Health, Office of Health Status Monitoring, 586-4600
Frank Haas, University of Hawaii School of Travel Industry Management, 956-7111
Sherry Broder, Esq., Law Office of Sherry Broder, 531-1411
Kevin McInerny, Esq., 702-849-3811

Appendix C: List of Legal Cases of James E. Dannemiller

Case[9]	Client	Service	Outcome
Hawaii Jury Selection Cases (approx. 5)	Various criminal cases (d)	Analysis of existing data and testimony.	All cases decided for plaintiff. Jury selection procedure eventually instituted by courts.
Legal Aid vs. Hawaii Department of Housing and Human Services	Legal Aid (p)	Analysis and testimony on adequacy of statistics for service administration (Flat Grant).	Decision to plaintiff. New system of data collection and analysis instituted at DHHS.
Hammer DeRobert vs. Honolulu Star Bulletin, et. al.	Honolulu Star Bulletin (d)	Survey, analysis, stipulation.	Finding for the defendant only partially based on statistical evidence.
Gotanda, et. al. vs. Hawaii Department of Labor and Industrial Relations	Gotanda, et. al. (p)	Statistics evaluation, secondary data analysis, deposition and testimony.	Finding for defendant; statistical evidence insufficient for claim.
Fair trade laws case Hawaii made product	Hawaii manufacturer (p)	Survey, analysis, stipulation.	Settled. Survey was instrumental in demonstrating fair trade violations.
Fair trade case (2) Hawaii Travel Services (California District Court)	Hawaii Travel Service (p)	Survey, analysis, deposition, stipulation.	Finding for the plaintiff. Stipulation was accepted as evidence.
Fair trade case (3) Hawaii name similarity	Plaintiff (p)	Survey, advice.	Survey showed no evidence of fair trade law violation. Case dismissed.
Newspaper libel case	Plaintiff (p)	Survey, analysis, advice.	Survey showed no evidence of libel. Case dismissed.
First Amendment / Pornography (more than seven cases)	Various defendants (d)	Surveys, analysis, stipulations, deposition.	Jury cases lost; none-jury won.
Palmyra Yacht murder cases (2)	Defendants (d)	Surveys, analysis, testimony.	Motions for change of venue lost.

(continued)

[9] List of major legal research projects and testimony undertaken by Mr. James E. Dannemiller between 1972 and 2003. This list is not intended to be a comprehensive compendium of all such work. In some cases, clients are not (and cannot be) identified by name or association. Additional details can be supplied if necessary.

Case[10]	Client	Service	Outcome
Feher vs. Hawaii Department of Labor and Industrial Relations	Plaintiff (p)	Data analysis, stipulations.	Finding for plaintiff. Largest settlement on record in Hawaii courts.
Abramson vs. University of Hawaii	Plaintiff (p)	Analysis, stipulations.	Case withdrawn. Data analysis showed no evidence of discrimination.
Bruce Yamashita vs. United States Marine Corps	Plaintiff (p) and the Japanese American Citizens League (p)	Statistics evaluation, analysis, stipulations, testimony before Marine Corps Board	U.S. Marine Corps accepted statistical testimony, granted all plaintiff's claims. Statistical evidence proved bias in the Marine Corps Officer training course in which Mr. Yamashita was a candidate. Yamashita was reinstated in the Marine Corps with the rank of Captain.
Estate of Ferdinand Marcos	Sherry Broder, Attorney at Law (p)	Statistical design and testimony pursuant to use of survey data in class action suit. Developed a plan by which testimony could be taken from a probability sample of plaintiffs and results could be applied to the population of over 10,000 plaintiffs.	Court accepted survey design, funded survey work, based findings on results. Awarded to plaintiffs. This was the first time that sampling principles were used to deal with a class action suit in the United States courts.
State of Hawaii vs. Kenneth W. Mathison	Koshiba & Young, Attorneys at Law (d)	Survey, statistical analysis.	Motion for change of venue denied.
Star Markets, Ltd. vs. Texaco	Defendant (d)	Likelihood of confusion and other surveys, deposition, testimony.	Two surveys were accepted by the Court.

(continued)

[10] List of major legal research projects and testimony undertaken by Mr. James E. Dannemiller between 1972 and 2003. This list is not intended to be a comprehensive compendium of all such work. In some cases, clients are not (and cannot be) identified by name or association. Additional details can be supplied if necessary.

Case[11]	Client	Service	Outcome
Hawaiian Sun vs. Monarch Foods	Plaintiff (p)	Likelihood of confusion and other surveys, deposition, testimony.	Settled out of court after survey results were submitted.
James C. Hansell, et al. vs. Pleasant Hill Cemetary, et al.	Court (c)	Design and execute a sampling system for class action damage suit.	Court applied the design and made awards based on results of sample trials.
Glenn Grant vs. Bess Press, et al.	Mark Bernstein, Attorney at Law (d)	Likelihood of confusion survey, secondary data analysis, deposition, testimony.	Settled out of court before survey results were submitted.
Ronald L. Obrey, Jr. vs. Hansford T. Johnson	Clayton Ikei, Attorney at Law (p)	Review statistics, analysis.	Pending.

Notes: (p)=professional services for plaintiff; (d)=professional services for defendant; (c)=court. Mr. Dannemiller has also completed surveys, data analyses, and testimony before Boards and Commissions in Hawaii. Tangentially, his work has included marketing research for law corporations, numerous jury polls, mock juries, and jury selection research. He has been deposed numerous times. He has been qualified as an expert by Federal and Hawaii State courts in the following fields: Survey research, statistical analysis, data collection procedures, and multivariate analysis. He has never failed to be qualified before a court or commission, and has never had materials rejected as evidence.

[11] List of major legal research projects and testimony undertaken by Mr. James E. Dannemiller between 1972 and 2003. This list is not intended to be a comprehensive compendium of all such work. In some cases, clients are not (and cannot be) identified by name or association. Additional details can be supplied if necessary.